Amendment to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1. (canceled)

2. (previously presented) A method for generating higher confidence information on data inputs of a process modeled as a finite state machine (FSM) represented by a reduced-state trellis, the FSM receiving a plurality of FSM inputs and producing a plurality of FSM outputs, the FSM inputs being defined on a base set of symbols, the method comprising:

(a) inputting said soft decision information in a first index set;

(b) performing forward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a forward truncated survivor path comprising decisions not specified by the reduced-state trellis, to produce forward state metrics;

(c) performing backward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a backward truncated survivor path comprising decisions not specified by the reduced-state trellis, the backward truncated survivor path being distinct from the forward truncated survivor path, to produce backward state metrics;

(d) operating on said forward state metrics and said backward state metrics to produce said higher confidence information; and

(e) outputting said higher confidence information.

3. (original) The method of claim 2, further comprising the steps of:

(f) modifying said input soft decision information using said output higher confidence information via a feedback path; and

(g) repeating steps (a) to (f) until a termination condition is met.

4. (original) The method of claim 2, wherein said operating comprises at least one of the following operations: summing, multiplication, minimum, maximum, minimum*, maximum*, linear weighting and exponentiation.

5. (previously presented) The method of claim 2, wherein the step of performing forward recursion calculations includes the steps of:

using residual state information to augment reduced-state trellis information to produce said forward state metrics; and

updating said residual state information.

6. (previously presented) The method of claim 2, wherein the step of performing backward recursion calculations includes the steps of:

using residual state information to augment reduced-state trellis information to produce said backward state metrics; and

updating said residual state information.

7. (original) The method of claim 5, wherein said residual state information is a plurality of decisions on said FSM inputs.

8. (original) The method of claim 6, wherein said residual state information is a plurality of decisions on said FSM inputs.

9. (original) The method of claim 7, wherein said decisions on said FSM inputs are defined on a revised set of symbols, wherein said revised set of symbols is a partitioning of said base set of symbols.

10. (original) The method of claim 8, wherein said decisions on said FSM inputs are defined on a revised set of symbols, wherein said revised set of symbols is a partitioning of said base set of symbols.

11. (previously presented) The method of claim 2, wherein the system is operative to perform at least one of the following functions:

iterative detection;

iterative decoding;

turbo detection;

turbo decoding;

message passing; and

belief propagation.

12. (original) The method of claim 2, wherein said finite state machine is operative to model at least one of the following:

a communication medium;

a storage medium; and

an imaging medium.

13. (original) The method of claim 2, wherein said finite state machine is operative to model at least one of the following:

allowable input and output pairs of a forward error correction code; and

a forward error correction encoder.

14. (original) The method of claim 2, wherein said finite state machine is operable to model a composite signal comprising at least one desired signal and at least one interference signal.

15. (previously presented) A method for generating higher confidence information on data inputs of a process modeled as a finite state machine (FSM) represented by a reduced-state trellis, the FSM receiving a plurality of FSM inputs and producing a plurality of FSM outputs, the FSM inputs being defined on a base set of symbols, the method comprising:

(a) inputting said soft decision information in a first index set;

(b) performing forward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a forward truncated survivor

path comprising decisions not specified by the reduced-state trellis, to produce forward state metrics and forward transition metrics;

(c) performing backward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a backward truncated survivor path comprising decisions not specified by the reduced-state trellis, the backward truncated survivor path being distinct from the forward truncated survivor path, to produce backward state metrics and backward transition metrics;

(d) operating on said forward state metrics, said forward state transition metrics, said backward state metrics and said backward state transition metrics to produce said higher confidence information; and

(e) outputting said higher confidence information.

16. (original) The method of claim 15, further comprising the steps of:

(f) modifying said input soft decision information using said output higher confidence information via a feedback path; and

(g) repeating steps (a) to (f) until a termination condition is met.

17. (original) The method of claim 15, wherein said operating comprises at least one of the following operations: summing, multiplication, minimum, maximum, minimum*, maximum*, linear weighting and exponentiation.

18. (previously presented) The method of claim 15, wherein the step of performing forward recursion calculations includes the steps of:

using residual state information to augment reduced-state trellis information to produce said forward state metrics; and

updating said residual state information.

19. (previously presented) The method of claim 15, wherein the step of performing backward recursion calculations includes the steps of:

using residual state information to augment reduced-state trellis information to produce said backward state metrics; and

updating said residual state information.

20. (original) The method of claim 18, wherein said residual state information is a plurality of decisions on said FSM inputs.

21. (original) The method of claim 19, wherein said residual state information is a plurality of decisions on said FSM inputs.

22. (previously presented) The method of claim 20, wherein said decisions on said FSM inputs are defined on a revised set of symbols, wherein said revised set of symbols is a partitioning of said base set of symbols.

23. (previously presented) The method of claim 21, wherein said decisions on said FSM inputs are defined on a revised set of symbols, wherein said revised set of symbols is a partitioning of said base set of symbols.

24. (previously presented) The method of claim 15, wherein the system is operative to perform at least one of the following functions:

iterative detection;

iterative decoding;

turbo detection;

turbo decoding;

message passing; and

belief propagation.

25. (original) The method of claim 15, wherein said finite state machine is operative to model at least one of the following:

a communication medium;

a storage medium; and

an imaging medium.

26. (original) The method of claim 15, wherein said finite state machine is operative to model at least one of the following:

allowable input and output pairs of a forward error correction code; and

a forward error correction encoder.

27. (original) The method of claim 15, wherein said finite state machine is operable to model a composite signal comprising at least one desired signal and at least one interference signal.

28. (previously presented) The method of claim 15, wherein the system is a system performing iterative detection, iterative decoding, turbo detection, turbo decoding, message passing, or belief propagation.

29. (previously presented) A system for generating higher confidence information on data inputs of a process modeled as a finite state machine (FSM) represented by a reduced-state trellis, the FSM receiving a plurality of FSM inputs and producing a plurality of FSM outputs, the FSM inputs being defined on a base set of symbols, the system comprising:

means for inputting said soft decision information in a first index set;

means for performing forward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a forward truncated survivor path comprising decisions not specified by the reduced-state trellis, to produce forward state metrics;

means for performing backward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a backward truncated survivor path comprising decisions not specified by the reduced-state trellis, the backward truncated survivor path being distinct from the forward truncated survivor path, to produce backward state metrics;

means for operating on said forward state metrics and said backward state metrics to produce said higher confidence information; and

means for outputting said higher confidence information.

30. (currently amended) A system for generating higher confidence information on data inputs of a process modeled as a finite state machine (FSM) represented by a reduced-state trellis, the FSM receiving a plurality of FSM inputs and producing a plurality of FSM outputs, the FSM inputs being defined on a base set of symbols, the system comprising:

means for inputting said soft decision information in a first index set;

means for performing forward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a forward truncated survivor path comprising decisions not specified by the reduced-state trellis, to produce forward state metrics and forward state transition metrics;

means for performing backward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a backward truncated survivor path comprising decisions not specified by the reduced-state trellis, the backward truncated survivor path being distinct from the forward truncated survivor path, to produce backward state metrics and backward state transition metrics;

means for operating on said forward state metrics, said forward state transition metrics, said backward state metrics and said backward state transition metrics to produce said higher confidence information; and

means for outputting said higher confidence information.

31. (previously presented) A device for generating higher confidence information on data inputs of a process modeled as a finite state machine (FSM) represented by a reduced-state trellis, the FSM receiving a plurality of FSM inputs and producing a plurality of FSM outputs, the FSM inputs being defined on a base set of symbols, the device comprising:

a plurality of device inputs for inputting said soft decision information in a first index set;

a plurality of processing units for performing forward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a forward truncated survivor path comprising decisions not specified by the reduced-state trellis, to produce forward state metrics, performing backward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a backward truncated survivor path comprising decisions not specified by the reduced-state trellis, the backward truncated survivor path being distinct from the forward truncated survivor path, to produce backward state metrics, and operating on said forward state metrics and said backward state metrics to produce said higher confidence information; and

a plurality of device outputs for outputting said higher confidence information.

32. (previously presented) A device for generating higher confidence information on data inputs of a process modeled as a finite state machine (FSM) represented by a reduced-state trellis, the FSM receiving a plurality of FSM inputs and producing a plurality of FSM outputs, the FSM inputs being defined on a base set of symbols, the device comprising:

a plurality of device inputs for inputting said soft decision information in a first index set;

a plurality of processing units for performing forward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a forward truncated survivor path comprising decisions not specified by the reduced-state trellis, to produce forward state metrics and forward state transition metrics, performing backward recursion calculations on said reduced-state trellis representation using said input soft decision information and using a backward truncated survivor path comprising decisions not specified by the reduced-state trellis, the backward truncated survivor path being distinct from the forward truncated survivor path, to produce backward state metrics and backward state transition metrics, and operating on said forward state metrics, said forward state transition metrics, said backward state metrics and said backward state transition metrics to produce said higher confidence information; and

a plurality of device outputs for outputting said higher confidence information.